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A STUDY OF COHO SALMON IN SOUTHEAST  
ALASKA: CHILKAT LAKE, CHILKOOT LAKE,  
YEHRING CREEK, AND VALLENAR CREEK<sup>1</sup>

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## ABSTRACT

The goal of the coho salmon *Oncorhynchus kisutch* research project is to improve the Department's ability to manage coho salmon fisheries in southeast Alaska. This will be accomplished by conducting research on the population dynamics of strategic coho salmon stocks and developing methods to forecast the size of their return, establishing stock escapement goals, and monitoring annual escapements and harvests to determine relative achievement of those goals.

In this paper we present 1987 coho salmon escapements, adult age, sex, and length information, smolt tagging data, and smolt age and length data collected at four on-going research sites. At Yehring Creek, Taku River, a minimal escapement estimate of 1,627 was recorded and 5,187 coho salmon smolt were coded-wire tagged. At Chilkat Lake, 938 adults were counted through the weir; no smolt work was conducted during 1987. At Chilkoot Lake, the escapement was estimated using a bootstrap method to give an estimate of 427 (SE = 19) adult coho salmon; no smolt tagging was conducted in 1987. At Vallenar Creek, counts were obtained via foot surveys. The peak observed escapement was 108.

The 1987 exploitation rate of adult coho salmon returning to Auke Creek was estimated at 43.5 percent. The exploitation rate of Chilkoot Lake coho salmon was 86.6 percent. This high rate of harvest, in conjunction with a low return, resulted in an escapement of 427 adults. There is concern that this escapement may be below sustained yield for this stock. It is recommended that the sport fishery and commercial fishery effort be adjusted to achieve a management escapement goal of a minimum 1,500 adults.

Escapement indices of spawning coho salmon were obtained for 75 streams in southeast. The weighted mean escapement index was 583 adults (SE = 116).

KEY WORDS: coho salmon, *Oncorhynchus kisutch*, escapement, smolt, harvest rate, contribution.

## INTRODUCTION

Coho salmon support important commercial, recreational, and subsistence fisheries in southeast Alaska. The commercial catch of coho salmon has increased considerably over levels of the 1960's-1970's as a result of increased natural production, contributions by hatcheries, and improved management. Since 1980, commercial catches have averaged 2.05 million coho salmon (ADF&G 1987) and the recreational harvest has averaged 49,700 coho salmon (Mills 1988). Increased catches, however, have not always been accompanied by increased escapements.

The majority of the commercial harvest occurs in mixed-stock fisheries, the management of which are not sensitive to the abundance of specific coho salmon stocks. In years of abundant returns, the escapement of some stocks has tended to be reduced in many areas of southeast Alaska. Furthermore, management of wild coho salmon stocks can be complicated by abundant returns of hatchery-reared fish: when wild returns are weak relative to hatchery returns, overharvest of the former can occur unless hatchery stocks are coded-wire tagged and their contributions are accurately estimated in-season.

Small streams, those that receive an average annual escapement of less than 200 coho salmon, comprise 96% of the known anadromous streams in southeast Alaska. In aggregate, they produce an estimated 60% of Southeast's annual coho salmon return (catch + escapement). Small stream stocks of coho salmon are thought to be less tolerant of under-escapement than numerically larger stocks and, if so, would be expected to show the first signs of reduced productivity. Indeed, low escapements of small stream stocks have occurred in 1983, 1986, 1987, and may have become geographically more widespread than in past years (unpublished data). Additionally, some large watersheds, such as Chilkat River and Chilkoot Lake, may not be producing returns commensurate with their estimated productive potential. This suggests the possibility of a gradual loss of robustness in those stocks. Fortunately, coho salmon populations can increase quickly under a favorable management environment. The goal of this program, therefore, is to improve the management of coho salmon fisheries by developing estimates of optimum escapements for a number of indicator stocks, establishing escapement goals, and monitoring annual escapements to determine the relative achievement of these goals.

A comprehensive research program on coho salmon population dynamics and fisheries will provide data for increased precision in management of coho salmon fisheries in southeast Alaska. Improved management precision is expected to result in increased abundance of coho salmon returns and produce long-term increases in sport, commercial, and subsistence harvests.

Collection of data on population dynamics of coho salmon is difficult and expensive and will require the cooperation and contribution of the resources of all fisheries divisions. The Alaska Department of Fish and Game's Divisions of Commercial Fisheries and Sport Fish have pooled their resources under the "Southeast Alaska Cooperative Coho Research Program" to collect data, and to develop and maintain a long-term comprehensive data base on coho salmon production, harvest rates, escapements, and migratory behavior. Under this cooperative program, the Division of Sport Fish will concentrate its efforts on coho salmon stocks that contribute to the sport fisheries of major population

centers and the Division of Commercial Fisheries will focus on coho salmon stocks that are primary contributors to commercial fisheries.

This paper presents estimates of the coho salmon escapements to Yehring Creek and Auke Creek (near Juneau), Chilkat and Chilkoot Lake (near Haines), and Vallenar Creek (near Ketchikan) (Figure 1). Additional information includes harvest rate information for the 1987 return to Auke Creek and Chilkoot Lake and coho salmon escapement indices for streams throughout southeast Alaska.

## METHODS AND MATERIALS

### Yehring Creek

#### Smolt Studies:

Coho salmon smolt were captured at Yehring Creek from 1 May to 7 June 1987 using three types of traps. To capture coho salmon smolt emigrating from beaver dams, "trough traps" made of 30.5 X 244.0 X 1.25 cm (12 X 96 X 1/2 in) plywood were installed at the outfalls of beaver dam complexes. Emigrants were directed into the trough by installing a 6.3 mm (1/4 in) mesh hardware cloth fence along the length of the dam. Once fish entered the troughs, they were swept through a 4 in rigid plastic pipe to a floating live box.

Fish were also captured with baited 6.3 mm (1/4 in) mesh "Gees minnow traps" and large 40.6 X 91.4 cm (16 X 36 in) traps of a similar design. All traps were checked daily and re-baited with salmon roe; all roe was disinfected with Betadine solution. Traps were moved continuously among sites to maximize catch.

To estimate the abundance of smolt leaving Yehring Creek, marked fish were released at upstream sites daily. Marked and non-marked fish were recaptured daily near the mouth of Yehring Creek with a floating incline plane trap. The inclined plane was a sheet of 6.3 mm (1/4 in) perforated aluminum 2.1 m (7 ft) long suspended by winches between plywood and foam pontoons. Fish that passed over the ramp were directed into a 45.7 X 122.0 cm (18 X 48 in) live box at the rear of the trap. The trap sampled a water column 1.2 m (4 ft) wide and 0.6 m (2 ft) in depth.

All smolts over 70 mm fork length were tranquilized with tricain methane sulfonate (MS 222), coded-wire tagged (CWT) following procedures listed in Koerner (1977), given an adipose finclip, and released. Length (nearest 1 mm fork length) and scale samples were taken from 250 smolts during each of three periods: 1 May-15 May; 16 May-31 May; 1 June-15 June.

Minimum-maximum air temperatures, water temperatures (nearest 0.1°C), and water depth (nearest 1 cm) were recorded daily between 0900 and 1000 hours.

#### Adult Escapement Estimate:

A tripod and picket weir with 1.9 cm (3/4 in) diameter pickets spaced on a 4.60 cm (1-13/16 in) centers in aluminum channel was operational at Yehring

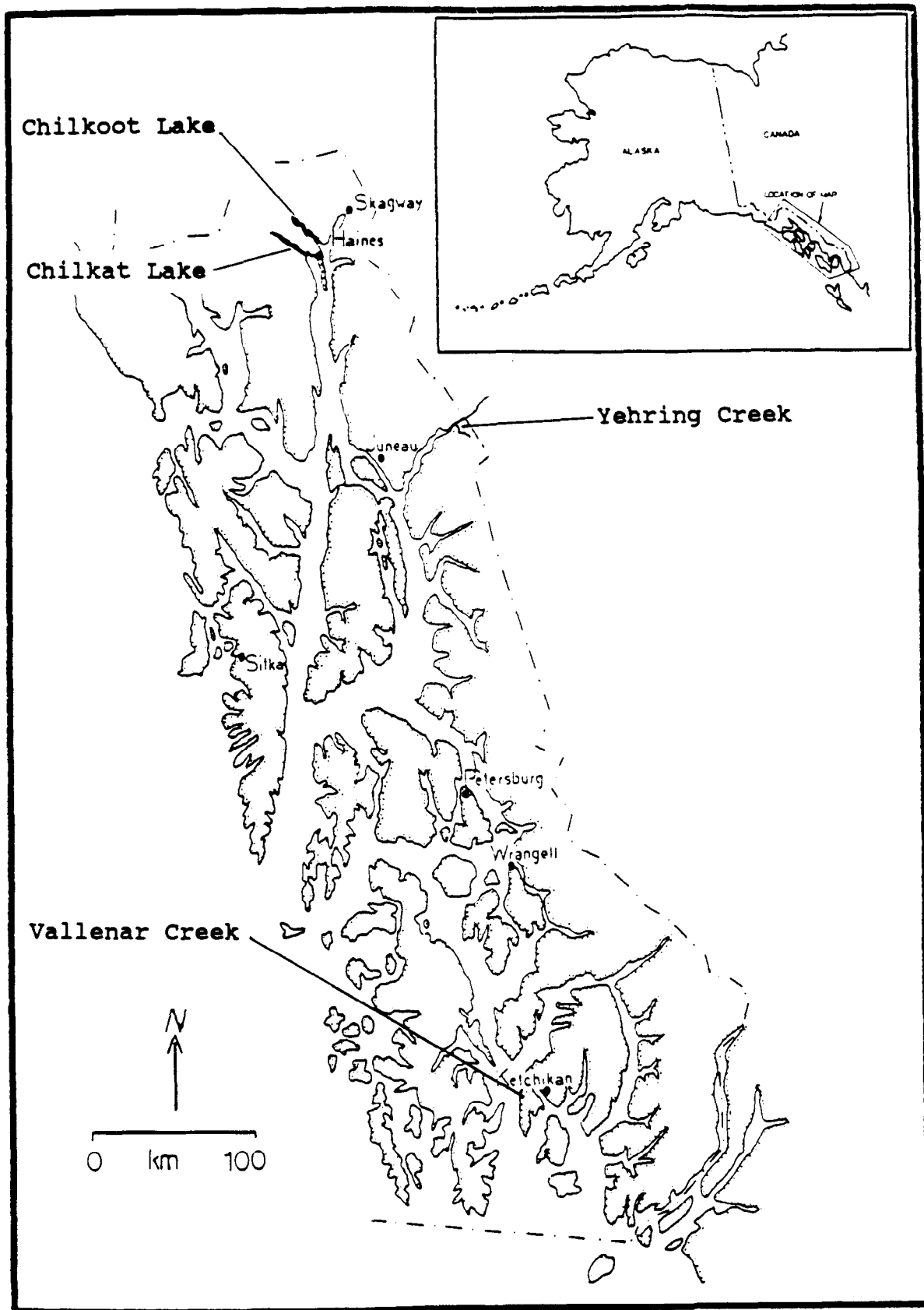


Figure 1. Coho salmon research sites in southeast Alaska administered by this project in 1987.

Creek from 23 August to 30 September 1987. Adult coho salmon (age .0 and age .1) were captured in a 2.4 X 2.4 m (8 X 8 ft) upstream migrant trap, tranquilized with a 12 volt DC electric shocking basket (Gunstrom and Bethers 1985; Orsi and Short 1987), measured to the nearest 1 mm (mid-eye to fork), sexed by examination of external characters, examined for hook wounds, and released alive on the upstream side of the weir.

Of the fish captured, 350 were sampled for age, sex, and length. Based on that value, every fifth fish encountered at the weir was sampled. Four scales were removed from the preferred area (the second row above the lateral line on a diagonal line from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin), mounted on gum cards, then pressed on acetate, and read with a microfiche reader.

In the event that the weir was overtopped by flood water and fish escaped upstream, a mark-recapture estimate of the escapement could be calculated. All fish trapped at the weir were marked by punching a 6.3 mm (1/4 in) diameter hole through the operculum with a paper punch. The location of the mark was changed every 10 days. After flood waters receded, fish could be captured with seines from large pools upstream of the weir and from spawning grounds in the headwaters. Population estimates and associated confidence intervals could then be obtained with the help of a Research and Technical Services (RTS) biometrician.

Air temperatures, water temperatures (nearest 0.1°C), and water depth (nearest 1 cm) were recorded daily between 0900 and 1000 hours.

#### Chilkat Lake

A tripod and picket weir with an upstream trap, maintained by the Division of Commercial Fisheries (ADF&G), was used to capture adult coho salmon at Chilkat Lake. The weir was constructed of 1.9 cm (3/4 in) pickets spaced on 4.60 cm (2 in) centers and was designed to retain coho salmon jacks (age .0). However, because of improper installation, the pickets did not maintain the required spacing and no jacks were captured. Consequently, all data collected refers to age .1 adults. Adult coho salmon (age .1) were captured in a 2.4 X 2.4 m (8 X 8 ft) square upstream migrant trap, tranquilized with a 12 volt DC electric shocking basket, measured to the nearest 1 mm (mid-eye to fork), sexed by examination of external characters, examined for hook wounds, checked for a missing adipose fin (indicating a coded-wire tag) and released on the upstream side of the weir.

Of the coho salmon captured, a minimum of 285 fish were sampled for age, sex, and length; approximately every other fish captured at the weir was sampled and data collected as described above.

#### Chilkoot Lake

A metal picket weir maintained by the Division of Commercial Fisheries (ADF&G) was used to count adult coho salmon (age .1) returning to Chilkoot Lake. The

weir was constructed of 1.9 cm (3/4 in) pickets spaced on 7.3 cm (2-7/8 in) centers and did not retain jack coho salmon (age .0). An upstream migrant trap was not used because fluctuations in water level causes fish to frequently change the area where they choose to cross the weir. Fish were counted at several locations on the weir by pulling pickets and allowing the fish to proceed upstream. Fish were captured with a dip net as they crossed the weir and examined for an adipose finclip (indicating the presence of a CWT tag) or retained for age, sex, and length sampling. Those sampled were tranquilized with a 12 volt DC electric shocking basket, measured to the nearest 1 mm (mid-eye to fork), sexed by examination of external characters, examined for hook wounds, and released on the upstream side of the weir. Air and water temperatures and water depths were recorded as described above.

### Vallenar Creek

Because of the small expected return of adult coho salmon to Vallenar Creek in 1987, it was deemed not to be cost effective to establish and operate an adult weir. Instead, the escapement was estimated during foot surveys in September and October. Age, sex, and length data on adults were not collected.

### Escapement Indices

Escapement indices were obtained on selected coho salmon index streams near Haines, Juneau, Ketchikan, Sitka, Petersburg, and Yakutat using foot, float, dive, or aerial methods. Surveys were repeated three or more times approximately 1 week apart to obtain maximal ordinal indices of abundance. Aerial escapement indices (using a Cessna 180, Super Cub, or helicopter) were done in some spawning streams that are too large for foot or float surveys. Escapement surveys were conducted from late September to December depending on local conditions.

### Analysis

Analysis of age-sex-length data for Yehring Creek, and Chilkat and Chilkoot Lakes was conducted on the State of Alaska's mainframe computer using SAS (SAS Institute Inc. 1985). A variance, [from which a standard deviation (SD) and standard error (SE) was computed] was calculated for each age-sex category (proportion) estimate:

$$(1) \quad \hat{p}_i = y_i/n_i$$

$$\hat{V}[\hat{p}_i] = [\hat{p}_i(1-\hat{p}_i)/(n-1)] \cdot (1-n/N)$$

where:  $y_i$  = number of fish in category  
 $n$  = sample size  
 $N$  = population size

In 1987, the Chilkoot weir was removed during floods on 1 October and replaced on 7 October. A bootstrap estimate procedure (Efron 1982) was used to estimate the number of fish that escaped through the weir while it was inoperable and the result added to the weir counts for an estimated total escapement to

the weir. The spawning ground escapement was estimated as the difference between the estimated escapement to the weir and the estimated sport harvest above the weir. The data used to compute the annual estimates and the basic code for the bootstrap are in Appendix Tables 1 and 2.

A mark recapture estimate and 95% C.I. for the Yehring Creek adult escapement were computed using Ricker (1975); specifically equations 3.7, page 78 for calculating the population estimate and the Poisson frequency distribution tables on page 343 for estimating values of R for 95% C.I.

Recovery of coded-wire tagged (CWTs) fish from the troll, purse seine, and gillnet fisheries was accomplished by the Division of Commercial Fisheries port sampling program and from the sport fishery by the Division of Sport Fish creel survey programs. Recovery of tagged adults at Auke Creek weir and Chilkoot weir was used to compute the tag ratio of the return. The Division of Fisheries Rehabilitation Enhancement and Development tag lab reported the estimated number of CWTs by time, area, and fishery strata. The techniques described in Clark and Bernard (1987) were used to estimate the harvest of Auke Creek and Chilkoot Lake stocks and estimate a variance for the harvest of each commercial fishery.

The techniques of Clark and Bernard (1987) presume that the catch and fraction tagged are known, not estimated. This is clearly not the case for wild stocks in sport fisheries. By ignoring this situation the standard errors of estimated catch should be viewed as minimal variances. However, the small coefficients of variation in estimates of catch from creel census and in estimates of the fraction tagged indicate that most of the true variance is represented in our estimate.

## RESULTS

### Yehring Creek

#### Smolt Studies:

Between 5 May and 7 June 1987, a total of 3,326 coho salmon smolt were caught in baited traps and 2,527 coho salmon smolt were caught in trough traps for a total count of 5,853. Of these, 5,187 were coded-wire tagged (tag number 4-27-9) and released. The migration began in early May, peaked on 24 May and was still in progress when the camp was closed on 6 June (Table 1).

A mark-recapture estimate of the smolt population was not accomplished because of poor catches of smolt in the incline plane trap. This problem could probably be solved by building a lead to the trap. However, leads were impractical due to public boat traffic. Night sets may also be an alternative.

Seven hundred and forty six smolt were sampled for age and length (Table 2). Age 1 smolt comprised 32% of the sample, age 2 smolt comprised 66%, and age 3 smolt comprised 2% of the sample. The smolt mean length was 91 mm; the larger fish emigrated at the end of the smolt season. The difference in size between early and late emigrants appears a result of growth of the year. Early smolt

Table 1. Daily counts of coho salmon smolts, water temperature, and water depth at Yehring Creek, Taku River, 5 May - 7 June 1987.

Date	Daily Count	Cumulative (5853)	Temp. (C)	Depth (cm)
5 MAY	13	13	3.0	104
6 MAY	69	82	3.0	104
7 MAY	57	139	4.0	106
8 MAY	54	193	4.0	104
9 MAY	33	226	5.5	102
10 MAY	39	265	5.5	100
11 MAY	54	319	5.0	100
12 MAY	103	422	5.0	101
13 MAY	69	491	5.0	101
14 MAY	132	623	5.0	100
15 MAY	200	823	6.5	101
16 MAY	151	974	5.5	103
17 MAY	135	1109	5.0	102
18 MAY	145	1254	5.5	102
19 MAY	82	1336	6.0	103
20 MAY	22	1358	7.0	105
21 MAY	159	1517	7.0	107
22 MAY	236	1753	5.0	113
23 MAY	194	1947	5.5	119
24 MAY	999	2946	6.0	121
25 MAY	318	3264	5.5	117
26 MAY	148	3412	5.5	125
27 MAY	389	3801	5.0	133
28 MAY	217	4018	5.5	131
29 MAY	217	4235	7.0	139
30 MAY	228	4463	6.5	149
31 MAY	297	4760	6.5	158
1 JUN	362	5122	7.0	155
2 JUN	121	5243	6.0	148
3 JUN	170	5413	7.0	141
4 JUN	155	5568	7.0	143
5 JUN	65	5633	7.0	141
6 JUN	220	5853	6.5	153
7 JUN			7.0	149
Total		5853		



Table 2. Mean fork length and age composition of coho salmon smolts sampled at Yehring Creek by 15-day period, 1 May - 15 June 1987.

Period	Age 1	Age 2	Age 3	Total
1 May - 15 May				
N	72	175	2	249
Percent Comp.	29	70	1	100
SE (%)	4.5	1.8	8.8	-
Mean length	79	87	100	85
SD	6.0	8.2	13.4	8.6
SE	0.7	0.6	9.5	0.5
16 May - 31 May				
N	74	167	8	249
Percent Comp.	30	67	3	100
SE (%)	4.4	2.0	6.6	-
Mean length	79	89	99	86
SD	6.5	9.8	7.4	10.2
SE	0.8	0.8	2.6	0.7
1 June - 15 June				
N	95	146	7	248
Percent Comp.	38	59	3	100
SE (%)	3.9	2.6	6.6	-
Mean length	92	108	117	103
SD	10.8	7.9	11.0	12.4
SE	1.1	0.7	0.0	0.8
Total				
N	241	488	17	746
Percent Comp	32	65	3	100
SE (%)	2.5	1.3	3.7	-
Mean length	84	94	106	91
SD	10.5	12.8	12.8	13.2
SE	0.7	0.6	3.1	0.5

had an average of 2 circuli beyond the winter annulus while late smolt had up to 6 circuli beyond the annulus.

#### Adult Escapement Estimate:

Between 23 August and 29 September, 1,540 adult coho salmon were counted at the Yehring Creek weir. On 30 September, the weir boat gate, a weir panel that can be lowered to permit boat passage, was irreparably damaged by high water and all fish behind the weir escaped upstream. Daily counts, plus records of water temperature and water depth, are listed in Table 3.

An estimate of the Yehring Creek escapement was obtained using a mark recapture sample from the spawning population on 12 November 1987. Eighty seven unmarked and 24 marked fish (marked at the weir from 21 September to 30 September) were collected. Four hundred and thirty two fish were originally marked at the weir during this period for an estimate of:  $(433 \times 112)/25 = 1,939$  adult coho during and after this sample period. The 95% C.I. about this estimate gives a range 1,325 to 2,957 fish. Adding the number of fish that passed the weir prior to 21 September gives a total estimated escapement of 3047 adults with a 95% C.I. of 2,433 - 4,065.

Analysis of scales from a sample of 1,132 fish produced 981 scales with legible fresh and saltwater zones. The mean length of the sampled fish was 631 mm (Table 4) and 85.7% were age 2.1 (1983 parent year).

#### Chilkat Lake

Between 15 September and 20 November, 938 age .1 coho salmon were counted through the Chilkat Lake weir. Immigration began on 17 September and was essentially complete on 20 November when icing required removal of the weir. Jacks were excluded from the data analysis because the picket spacing of the weir allowed these fish to escape upstream. Daily counts, water temperature and depth are listed in Table 5.

Of the 957 adult coho salmon counted, 641 were sampled. Of these, 557 had readable scales. The Chilkat Lake adults averaged 651 mm long (Table 6) and 82% were age 2.1 (parent year 1983).

#### Chilkoot Lake

#### Adult Escapement Estimate:

Five hundred and fifty age .1 coho salmon were counted at the Chilkoot Lake weir between 31 August and 2 November (Table 7). Jacks were not counted because the spacing between weir pickets allowed most fish of this age class to migrate upstream. The Chilkoot weir was removed during high water from 1 October through 6 October. The estimate was reconstructed using a bootstrap estimator to give an estimated escapement to the weir of 697 (SE = 19). An estimated 270 adult coho were harvested by sport anglers above the weir. This gives an estimated escapement to the spawning grounds of 427 coho salmon, the poorest escapement on record.

Table 3. Daily counts of age .0 and .1 adult coho salmon, water temperature, and water depth at the Yehring Creek weir, Taku River, 23 August - 29 September 1987.

Date	Daily Count	Cumulative (1540)	Temp. (C)	Depth (cm)
16 AUG		0	-	119
17 AUG		0	12.0	115
18 AUG		0	11.5	107
19 AUG		0	10.5	103
20 AUG		0	12.0	101
21 AUG		0	11.0	102
22 AUG		0	9.0	105
23 AUG	22	22	11.5	106
24 AUG	18	40	11.0	112
25 AUG	27	67	11.0	132
26 AUG	43	110	11.0	170
27 AUG	0	110	10.5	215
28 AUG	49	159	11.0	154
29 AUG	17	176	11.0	110
30 AUG	31	207	11.0	117
31 AUG	80	287	9.5	149
1 SEP	52	339	9.0	139
2 SEP	22	361	10.0	121
3 SEP	16	377	9.5	116
4 SEP	81	458	10.0	133
5 SEP	46	504	9.5	161
6 SEP	48	552	8.5	141
7 SEP	19	571	9.5	122
8 SEP	46	617	10.0	150
9 SEP	35	652	9.5	159
10 SEP	40	692	9.0	207
11 SEP	0	692	9.0	237
12 SEP	0	692	9.0	181
13 SEP	23	715	8.0	149
14 SEP	80	795	8.0	127
15 SEP	48	843	8.5	119
16 SEP	28	871	8.5	113
17 SEP	74	945	8.0	125
18 SEP	53	998	8.0	134
19 SEP	50	1048	8.0	131
20 SEP	60	1108	8.0	128
21 SEP	24	1132	8.0	123
22 SEP	32	1164	8.0	112
23 SEP	53	1217	8.0	104
24 SEP	26	1243	7.5	100
25 SEP	10	1253	7.5	96
26 SEP	8	1261	8.0	98

Continued

Table 3. Daily counts of age .0 and .1 adult coho salmon, water temperature, and water depth at the Yehring Creek weir, Taku River, 23 August - 29 September 1987 (continued).

Date	Daily Count	Cumulative (1540)	Temp. (C)	Depth (cm)
27 SEP	73	1334	7.5	114
28 SEP	68	1402	7.5	115
29 SEP	138	1540	7.5	136
30 SEP	WEIR	OUT	7.5	158
1 OCT			7.5	212
2 OCT			7.5	215
3 OCT			7.0	217
4 OCT			7.0	169
5 OCT			GAGE	OUT
Total		1540		

Table 4. Mean length (mm mid-eye to fork), and age and sex composition of adult coho salmon sampled at Yehring Creek weir, Taku River, 23 August - 29 September 1987.

		Mean Length of Sample by Parent Year					
		1985	1984		1983	1982	Total
		1.0	1.1	2.0	2.1	3.1	
Male	Sample Size	2	66	1	382	5	456
	Mean Length	405	593	524	621	644	616
	SD	162.6	99.8	-	86.1	65.9	89.7
	SE	115.0	12.3	-	4.4	29.5	4.2
	Percent Comp.	0.2	6.7	0.1	39.0	0.5	46.5
	SE (%)	4.5	3.0	-	1.9	3.5	1.7
Female	Sample Size	0	61	0	459	5	525
	Mean Length	-	637	-	646	629	645
	SD	-	58.2	-	59.6	59.0	58.6
	SE	-	7.4	-	2.7	26.4	2.6
	Percent Comp.	0	6.2	-	46.7	0.5	53.5
	SE (%)	-	3.0	-	1.7	3.5	1.4
Total	Sample Size	2	127	1	841	10	981
	Mean Length	405	614	524	634	637	631
	SD	162.6	85.1	-	73.4	59.5	76.0
	SE	115.0	7.5	-	2.5	18.8	2.4
	Percent Comp.	0.2	13.0	0.1	85.7	1.0	100
	SE (%)	4.5	2.7	-	0.4	3.3	0

Table 5. Daily counts of age .1 adult coho salmon, water temperature, and water depth at the Chilkat Lake weir, 15 September - 20 November 1987.

Date	Daily Count	Cumulative (938)	Temp. (C)	Depth (cm)
15 SEP	0	0	12	40
16 SEP	0	0	12	45
17 SEP	1	1	11	50
18 SEP	5	6	10	55
19 SEP	2	8	9	60
20 SEP	23	31	9	60
21 SEP	4	35	10	53
22 SEP	22	57	10	49
23 SEP	39	96	11	43
24 SEP	36	132	10	39
25 SEP	16	148	10	37
26 SEP	15	163	10	38
27 SEP	1	164	10	42
28 SEP	8	172	10	41
29 SEP	25	197	8	41
30 SEP	55	252	8	39
1 OCT	0	252	9	63
2 OCT	0	252	4	86
3 OCT	0	252	5	111
4 OCT	0	252	9	102
5 OCT	0	252	7	88
6 OCT	0	252	8	76
7 OCT	0	252	8	68
8 OCT	0	252	8	61
9 OCT	0	252	8	58
10 OCT	2	254	8	49
11 OCT	0	254	8	42
12 OCT	27	281	8	40
13 OCT	1	282	8	37
14 OCT	4	286	8	32
15 OCT	0	286	8	29
16 OCT	3	289	7	25
17 OCT	13	302	6	24
18 OCT	7	309	6	20
19 OCT	30	339	7	16
20 OCT	51	390	6	16
21 OCT	2	392	5	15
22 OCT	5	397	5	15
23 OCT	2	399	5	15
24 OCT	12	411	5	15

Continued

Table 5. Daily counts of age .1 adult coho salmon, water temperature, and water depth at the Chilkat Lake weir, 15 September - 20 November 1987 (continued).

Date	Daily Count	Cumulative (938)	Temp. (C)	Depth (cm)
25 OCT	6	417	5	12
26 OCT	19	436	5	12
27 OCT	1	437	5	11
28 OCT	2	439	6	14
29 OCT	10	449	5	13
30 OCT	20	469	5	11
31 OCT	11	480	5	10
1 NOV	11	491	4	8
2 NOV	24	515	4	7
3 NOV	10	525	4	9
4 NOV	5	530	4	9
5 NOV	4	534	4	9
6 NOV	40	574	5	10
7 NOV	4	578	5	10
8 NOV	26	604	4	8
9 NOV	19	623	5	7
10 NOV	17	640	5	6
11 NOV	17	657	5	7
12 NOV	108	765	5	16
13 NOV	40	805	4	14
14 NOV	26	831	4	14
15 NOV	37	868	3	13
16 NOV	3	871	3	13
17 NOV	35	906	3	10
18 NOV	21	927	3	11
19 NOV	4	931	3	10
20 NOV	7	938	3	10
Total		938		

Table 6. Mean length (mm mid-eye to fork) by sex and age and age composition of non-jack adult coho salmon sampled at Chilkat Lake weir, 17 September - 20 November 1987.

		Mean Length of Sample by Parent Year			
		1984	1983	1982	
		1.1	2.1	3.1	Total
Male	Sample Size	54	225	3	282
	Mean Length	648	655	497	652
	SD	65.9	61.1	73.8	64.1
	SE	9.0	4.0	42.6	3.8
	Percent Comp.	9.7	40.4	0.5	50.6
	SE (%)	3.8	2.5	5.1	2.0
Female	Sample size	35	232	8	275
	Mean Length	637	652	663	650
	SD	39.6	36.4	25.1	36.8
	SE	6.7	2.4	8.9	2.2
	Percent Comp.	6.3	41.6	1.4	49.4
	SE (%)	4.0	2.5	4.5	2.1
Total	Sample Size	89	457	11	557
	Mean Length	644	653	618	651
	SD	57.0	50.0	86.7	52.4
	SE	6.0	2.3	26.1	2.2
	Percent Comp.	16.0	82.0	2.0	100.0
	SE (%)	3.6	0.8	4.4	0



Table 7. Daily counts of age .1 adult coho salmon, water temperature, and water depth at the Chilkoot Lake weir, 31 August - 2 November 1987.

Date	Daily Count	Cummulative (550)	Temp. (C)	Depth (cm)
31 AUG	2	2	9.4	29
1 SEP	0	2		
2 SEP	0	2		
3 SEP	2	4	8.9	19
4 SEP	0	4		
5 SEP	0	4		
6 SEP	2	6	9.4	37
7 SEP	2	8	10	30
8 SEP	1	9	9.4	33
9 SEP	2	11	9.4	37
10 SEP	0	11		
11 SEP	0	11		
12 SEP	0	11		
13 SEP	2	13	7.8	37
14 SEP	3	16	7.2	31
15 SEP	5	21	10	23
16 SEP	4	25	7.8	19
17 SEP	5	30	7.8	25
18 SEP	12	42	7.8	31
19 SEP	15	57	7.8	35
20 SEP	23	80	7.2	35
21 SEP	15	95	7.2	32
22 SEP	22	117	7.8	28
23 SEP	16	133	8.3	22
24 SEP	32	165	7.8	15
25 SEP	21	186	7.2	14
26 SEP	16	202	6.7	13
27 SEP	34	236	6.7	26
28 SEP	21	257	6.7	24
29 SEP	14	271	6.7	25
30 SEP	18	289	7.8	30
1 OCT	1	290	7.8	47
2 OCT	Weir out	290		
3 OCT	-	290		
4 OCT	-	290		
5 OCT	-	290		
6 OCT	-	290		
7 OCT	4	294	6.7	29
8 OCT	2	296	6.1	23
9 OCT	2	298	6.1	17
10 OCT	0	298	6.7	10

Continued

Table 7. Daily counts of age .1 adult coho salmon, water temperature, and water depth at the Chilkoot Lake weir, 31 August - 2 November 1987 (continued).

Date	Daily Count	Cummulative (550)	Temp. (C)	Depth (cm)
11 OCT	1	299	7.8	11
12 OCT	1	300	6.1	15
13 OCT	0	300	6.1	15
14 OCT	0	300	6.7	14
15 OCT	2	302	5.6	13
16 OCT	2	304	5.6	14
17 OCT	0	304	5.6	11
18 OCT	5	309	6.7	9
19 OCT	16	325	6.7	12
20 OCT	51	376	5.6	27
21 OCT	33	409	5.6	23
22 OCT	7	416	5.6	15
23 OCT	31	447	5.6	14
24 OCT	9	456	5.6	16
25 OCT	11	467	6.1	15
26 OCT	8	475	5.6	14
27 OCT	24	499	5.6	12
28 OCT	23	522	5.6	17
29 OCT	24	546	5.6	14
30 OCT	0	546	4.4	9
31 OCT	1	547	5	5
1 NOV	2	549	5.6	2
2 NOV	1	550	5	4
Total		550		

#### Adjustments to Chilkoot Lake Escapements:

Estimates of harvest of coho salmon above Chilkoot weir are available for years 1985 through 1987. Many data bases maintained in the region have not considered this added component of harvest. Escapement data should be updated based on the harvest data in Table 8.

Of the 550 adult coho salmon counted at the weir, 311 were sampled and for age, sex, and length data. Of these scales, 261 had legible fresh and salt-water zones. The adults returning to Chilkoot Lake averaged 668 mm long (Table 9) and 71.7% were age 2.1 (parent year 1983).

#### Harvest Rates of Chilkoot Lake Coho Salmon:

Of the 550 adult coho salmon counted at the weir, 311 were sampled and examined for adipose clips (indicating the presence of a coded-wire tag). Of these, 29 had adipose clips for an untagged/tagged ratio of  $311/29 = 10.7241$ . The fraction tagged was 0.093 (the standard error is 0.012) after correction for finite escapement.

The estimated return to Chilkoot Lake was 3,194 adult coho salmon. This is the lowest recorded return for the years of record. The estimated harvest of Chilkoot coho salmon in 1987 totaled 86.6% of the return (Table 10). Of the harvest, the troll fishery took 41%, the Lynn Canal drift gillnet fishery took 44%, and the Chilkoot River freshwater sport fishery took 13% (Table 11). The preliminary coded-wire tag recovery data for the 1987 Chilkoot coho salmon return is listed in Appendix Table 3.

#### Auke Creek Weir

The total harvest rate of the Auke Creek coho salmon return was 43.5% (Table 12) of an estimated return of at 1,182 age .1 adults. Of the harvest, the troll fishery took 84%, the drift gillnet fishery took 11%, and the Juneau marine sport fishery took 5% (Table 13). The preliminary coded-wire tag recovery data for the 1987 coho salmon return to Auke Creek is listed in Appendix Table 4.

#### Vallenar Creek

Because of the small expected escapement of adult coho salmon to Vallenar Creek in 1987, it was deemed not to be cost effective to establish and operate an adult weir at the site. Instead, the escapement was estimated during foot surveys; age, sex, and length data were not collected. Foot surveys obtained indices of 108 coho salmon on 8 October 1987 and 71 on 25 October 1987.

#### Escapement Indices

Between 1 September and 31 November, 75 streams were surveyed and the number of coho salmon spawners were counted in each (Appendix Table 5). These indices were weighted by stream size and a mean weighted escapement index for southeast Alaska was computed as 583 with a standard error of 116.

Table 8. Adjustments to the adult coho salmon escapement to Chilkoot Lake to account for above-weir harvest of spawners, 1979 - 1987.

Year	Sport Harvest			Escapement	
	Below Weir	Above Weir	Total	Old Value	New Value
1979	ND	ND	258	899	ND
1983	ND	ND	707	1839	ND
1984	ND	ND	614	ND	ND
1985	464	297	761	2188	1891
1986	527	181	708	1951	1770
1987	90	270	360	697	427

Table 9. Mean length (mm mid-eye to fork), and age and sex composition of non-jack adult coho salmon sampled at Chilkoot Lake weir, 31 August - 2 November 1987.

		Mean Length of Sample by Parent Year			Total
		1984	1983	1982	
		1.1	2.1	3.1	
Male	Sample Size	33	82	2	117
	Mean Length	669	672	718	672
	SD	19.6	44.3	10.6	38.9
	SE	3.4	4.9	7.5	3.6
	Percent Comp.	12.6	31.4	0.7	44.8
	SE (%)	5.5	4.3	8.7	-
Female	Sample Size	37	105	2	144
	Mean Length	660	666	653	664
	SD	32.4	31.1	31.8	31.3
	SE	5.3	3.0	22.5	2.6
	Percent Comp.	14.2	40.2	0.7	55.2
	SE (%)	5.4	3.7	7.0	-
Total	Sample Size	70	187	4	261
	Mean Length	664	668	685	668
	SD	27.3	37.5	42.2	35.1
	SE	3.2	2.7	21.1	2.1
	Percent Comp.	26.8	71.7	1.5	100
	SE (%)	4.6	1.8	7.0	-

Table 10. Estimated harvest rate of Chilkoot Lake coho salmon by fishery and statistical week, 1987. All estimates except the freshwater sport harvest are the product of the estimated harvest by quadrant of Chilkoot Lake coded-wire tags (CWT) and the CWT tag ratio (notag/tag) of adults sampled at Chilkoot weir = 10.7241. Estimates of freshwater sport catch is by 2-week period. The estimated escapement was 427 adults.

Stat. Week	Troll	Purse Seine	Marine Sport	Drift Gillnet	Fresh. Sport	Total	Harvest Rate	
							Wkly	Cum
27	31	0	0	0	0	31	1.0%	1.0%
28	0	0	0	0		0	0.0%	1.0%
29	0	0	0	0	0	0	0.0%	1.0%
30	131	0	0	0		131	4.1%	5.1%
31	112	0	0	0	0	112	3.5%	8.6%
32	110	36	0	0		146	4.6%	13.1%
33	52	0	0	0	0	52	1.6%	14.8%
34	142	0	0	0		142	4.4%	19.2%
35	82	0	0	50	0	132	4.1%	23.4%
36	318	0	0	57		375	11.7%	35.1%
37	112	0	0	55	6	173	5.4%	40.5%
38	44	0	0	130	-	174	5.4%	46.0%
39	0	0	0	436	206	642	20.1%	66.1%
40	0	0	0	509	-	509	15.9%	82.0%
41	0	0	0	0	148	148	4.6%	86.6%
Total	1134	36	0	1237	360	2767	-	86.6%
SE	202	36	-	352	ND	ND		

Table 11. Estimated return of Chilkoot Lake coho salmon, harvest, and harvest rates by fishery in 1979, 1983, and 1987.

	1979	1983	1987
Troll	1292 33.5%	3898 43.4%	1134 35.5%
Purse seine	87 2.2%	571 6.4%	36 1.1%
Drift gillnet	1466 38.1%	2711 30.1%	1237 38.7%
In-river sport	258 6.7%	707 7.9%	360 11.3%
Total catch	3103 80.5%	7887 87.8%	2767 86.6%
Escapement	750 19.5%	1100 12.2%	427 13.4%
Return	3853 100.0%	8987 100.0%	3194 100.0%

Table 12. Estimated harvest of coded-wire tagged Auke Lake coho salmon in the various fisheries of southeast Alaska by statistical week, 1987. Estimates are based on a tag ratio of 100%. The escapement was 668.

Stat. Week	Troll	Purse Seine	Marine Sport	Drift Gillnet	Total Harvest	Harvest Rate Wkly.	Cum.
27	3				3	0.3%	0.3%
28					0	0.0%	0.3%
29	13				13	1.1%	1.4%
30	27			5	32	2.7%	4.1%
31	26				26	2.2%	6.3%
32	49				49	4.1%	10.4%
33	15		22		37	3.1%	13.5%
34	71				71	6.0%	19.5%
35	122	4			126	10.7%	30.2%
36	81			5	86	7.3%	37.5%
37	16		1	46	63	5.3%	42.8%
38	8				8	0.7%	43.5%
Total	431	4	23	56	514	-	43.5%
SE	34	ND	ND	15	ND		



Table 13. Estimated return of Auke Lake coho salmon, harvest, and harvest rate by fishery, 1987.

Fishery	Harvest %Comp.
Troll	431 36.5%
Purse seine	4 0.3%
Drift gillnet	56 4.7%
Marine Sport	23 2.0%
Total harvest	514 43.5%
Escapement	668 56.5%
Return	1182 100.0%

## DISCUSSION

The coho salmon research program should expand its efforts in the Taku River watershed in 1988 and beyond. An estimated 6,000 coded-wire tagged coho salmon representing a wide array of sub-stocks will pass through the fisheries and return to Taku River in 1988. It is believed that the early-run coho salmon stocks returning to the Taku River is an important component of the Juneau Marine coho salmon sport catch. Past escapement indices suggest that these stocks are under-escaped relative to the amount of rearing habitat available (Shaul pers comm). Additionally, increased harvest of early run coho salmon may occur if enhancement of sockeye salmon at Turner Lake is a success. The 1988 return will provide the first opportunity to evaluate the importance of these stocks.

This can be done by operating the Division of Commercial Fisheries' Canyon Island fish wheel throughout the season and to 15 October 1988. Coded-wire tags recovered in the fisheries, at the fishwheel, and on the spawning grounds will allow estimation of the return and stock distribution. Recovery of tags applied at the fish wheel, in upstream Canadian test fisheries, and on spawning grounds in the upper, middle, and lower portions of Taku River will be used to estimate stock distribution and escapement.

The available data suggest that production of coho salmon in Chilkoot Lake is not optimum. It is very low for a watershed of its size and known productivity. There are many streams in southeast Alaska that produce comparable returns from watersheds of far smaller size. Also, coho salmon production from freshwater is generally more stable: measured as percent standard deviation, the Auke Creek smolt production varies by  $\pm 12\%$ ; Sashin Creek,  $\pm 35\%$  (Crone and Bond 1976); and Chilkoot Lake an estimated  $\pm 63\%$ .

This year's harvest rate of 86.6% in conjunction with the low estimated return resulted in an escapement of 427 (SE = 19) adults. This level may be less than that required for sustained yield and could result in decreased future production. The production could be improved through a program of increased escapement. Unfortunately, there are no data with which to estimate an escapement goal. Those data may take 10 years or more to gather. In the interim, managers should consider setting a management escapement goal. Elsewhere in southeast Alaska, populations easily tolerate harvest rates of 60% with no "apparent" difficulty. Therefore, a minimum escapement goal of 1,200-3,600 adults would be appropriate. This could be achieved by limiting or closing the sport fishery above the weir and by adopting conservation measures in the drift gillnet fishery.

An annual program to estimate the return of coho salmon to Chilkoot Lake should begin as soon as funding permits. The minimal objective of the program should be to estimate an optimum escapement goal for the Chilkoot Lake stock. A program should be developed to estimate the stock composition of the coho salmon harvested by the marine sport fisheries in Juneau, Ketchikan, and Sitka. By identifying which streams support the sport fishery, management could take more effective steps in optimizing production to the fishery.

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## APPENDIX

Appendix Table 1. Escapement data used to compute the bootstrap estimate for the 1987 Chilkoot Lake coho salmon escapement.

Year	Escapement		1987	
	1 Sept - 30 Sept + 7 Oct - 15 Nov	Total	Proportion	Estimate
1976	711	946	0.752	731
1978	844	1035	0.816	674
1979	768	899	0.854	644
1983	1528	1839	0.831	661
1985	1716	2188	0.784	701
1986	1362	1951	0.698	787

Appendix Table 2. Basic code used to make random selections for computation of the 1987 bootstrap estimate of the Chilkoot Lake coho salmon escapement.

---

```
10 OPEN "o",#1,"bootdta"
20 FOR J = 1 TO 100
30     RANDOMIZE TIMER
40     YMEAN=0
50 FOR I=1 TO 6
60     X=INT(RND*6)+1
70     IF X = 1 THEN Y = 731
80     IF X = 2 THEN Y = 674
90     IF X = 3 THEN Y = 644
100    IF X = 4 THEN Y = 661
110    IF X = 5 THEN Y = 701
120    IF X = 6 THEN Y = 787
130    LET E=E+Y
140    PRINT X,Y,E
150 NEXT I
160 LET YMEAN = E/6
170 PRINT YMEAN
180 PRINT #1, YMEAN
190 LET E=0
200 NEXT J
210 CLOSE #1
```

---

Appendix Table 3. Preliminary 1987 coded wire tag recovery data for Chilkoot Lake coho salmon.

Sample... Source	Stat Week	Gear...	----- QD PMFC DISTRC R	Areas -----	Observed	Expansion Factor(WQ)	Preferred Expansion	Contrib.. (WQ)	Preferred Contrib.
1987 CHILKOOT LAKE (WILD) COHO RANDOM RECOVERIES									
COMMERCIAL	27	TROLL	NW	-  1	1	2.932	2.701	2.93	2.70
	27				1	2.932	2.701	2.93	2.70
COMMERCIAL	30	TROLL	NW	-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW COUT	113-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW CNTR	114-21 1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW COUT	113-94 1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW	-  1	1	2.447	2.701	2.45	2.70
	30				5	12.235	13.505	12.24	13.51
COMMERCIAL	31	TROLL	NW	-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW CNTR	114-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW	-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW NOUT	116-  1	1	2.616	2.701	2.62	2.70
	31				4	10.464	10.804	10.46	10.80
COMMERCIAL	32	TROLL	NW	-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW NOUT	116-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW COUT	113-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL		-  1	1				
COMMERCIAL	32	TROLL	NW COUT	-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	SEINE	NE	-  1	1	3.348		3.35	
	32				6	11.548	10.804	11.55	10.80
COMMERCIAL	33	TROLL	NW	-  1	1	4.873	3.962	4.87	3.96
	33				1	4.873	3.962	4.87	3.96
COMMERCIAL	34	TROLL	NW	-  1	1	3.302	3.962	3.30	3.96
COMMERCIAL	34	TROLL	NW NOUT	116-  1	1	3.302	3.962	3.30	3.96
COMMERCIAL	34	TROLL	NW	-  1	1	3.302	3.962	3.30	3.96
COMMERCIAL	34	TROLL	NW	-  1	1	3.302	3.962	3.30	3.96
	34				4	13.208	15.848	13.21	15.85

Continued



Appendix Table 3. Preliminary 1987 coded wire tag recovery data for Chilkoot Lake coho salmon (continued).

Sample... Source	Stat Week	Gear...	----- Areas ----- QD PMFC DISTR R	Observed	Expansion. Factor(WQ)	Preferred Expansion	Contrib.. (WQ)	Preferred Contrib.
COMMERCIAL	35	TROLL	NW    -  1	1	4.571	3.962	4.57	3.96
COMMERCIAL	35	TROLL	NE CNTR 112-	1	3.061	2.328	3.06	2.33
COMMERCIAL	35	GILLNET	NE LYNN 115-	1	4.625	11.453	4.63	11.45
				3	12.257	17.743	12.26	17.74
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT 116-	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT 156-	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW COUT 113-	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-25	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT  -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	GILLNET	NE LYNN 115-	1	5.322	5.892	5.32	5.89
				9	34.954	37.588	34.95	37.59
COMMERCIAL	37	TROLL	NW NOUT  -  1	1	5.208	3.962	5.21	3.96
COMMERCIAL	37	TROLL	-  1	1				
COMMERCIAL	37	GILLNET	NE    -  1	1	5.083		5.08	
				3	10.291	3.962	10.29	3.96
COMMERCIAL	38	TROLL	NW CNTR 114-	1	4.118	3.962	4.12	3.96
COMMERCIAL	38	GILLNET	NE LYNN 115-	1	12.138	24.132	12.14	24.13
				2	16.256	28.094	16.26	28.09
COMMERCIAL	39	GILLNET	NE LYNN 115-	1	13.539	12.749	13.54	12.75
COMMERCIAL	39	GILLNET	NE LYNN 115-	1	13.539	12.749	13.54	12.75
COMMERCIAL	39	GILLNET	NE LYNN 115-	1	13.539	12.749	13.54	12.75
				3	40.617	38.247	40.62	38.25

Continued

Appendix Table 3. Preliminary 1987 coded wire tag recovery data for Chilkoot Lake coho salmon (continued).

COMMERCIAL	40 GILLNET NE LYNN 115-	1	1	6.774	6.540	6.77	6.54
COMMERCIAL	40 GILLNET NE LYNN 115-	1	1	6.774	6.540	6.77	6.54
COMMERCIAL	40 GILLNET NE LYNN 115-	1	1	6.774	6.540	6.77	6.54
COMMERCIAL	40 GILLNET NE LYNN 115-	1	1	6.774	6.540	6.77	6.54
COMMERCIAL	40 GILLNET NE LYNN 115-	1	1	6.774	6.540	6.77	6.54
COMMERCIAL	40 GILLNET NE LYNN 115-	1	1	6.774	6.540	6.77	6.54
COMMERCIAL	40 GILLNET NE LYNN 115-	1	1	6.774	6.540	6.77	6.54
				-----			
	40		7	47.418	45.780	47.42	45.78
				-----			
COMMERCIAL			48	217.053	229.038	217.05	229.04
TOTALS .....				48.	217.053	229.038	217.05 229.04

1987 CHILKOOT LAKE (WILD) COHO  
SELECT RECOVERIES

COMMERCIAL	31 TROLL			-	1	1
COMMERCIAL	31 TROLL			-	1	1
						-----
	31					2
COMMERCIAL	35 TROLL			-	1	1
COMMERCIAL	35 TROLL	NE CNTR 112-16	1			1
						-----
	35					2
COMMERCIAL	36 TROLL			-	1	1
COMMERCIAL	36 TROLL			-	1	1
COMMERCIAL	36 TROLL			-	1	1
COMMERCIAL	36 TROLL			-	1	1
						-----
	36					4
COMMERCIAL	37 TROLL	NW CNTR 114-25	1			1
						-----
	37					1
COMMERCIAL	38 TROLL			-	1	1
COMMERCIAL	38 TROLL			-	1	1
						-----
	38					2

Continued

Appendix Table 3. Preliminary 1987 coded wire tag recovery data for Chilkoot Lake coho salmon (continued).

---

COMMERCIAL	39 TROLL			-	1	1
COMMERCIAL	39 TROLL			-	1	1
COMMERCIAL	39 TROLL			-	1	1
					----	
	39					3
					----	
COMMERCIAL						14
SPORT	40	NE LYNN 115-32	1			1
SPORT	40	NE LYNN 115-32	1			1
					----	
	40					2
					----	
SPORT						2
TOTALS	.....					16

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Appendix Table 4. Preliminary 1987 coded wire tag recovery data for Auke Creek coho salmon.

Sample... Source	Stat Week	Gear...	----- Areas ----- QD PMFC DISTR R	Observed	Expansion. Factor(WQ)	Preferred Expansion	Contrib.. (WQ)	Preferred Contrib.
RANDOM RECOVERIES								
COMMERCIAL	27	TROLL	NW    -  1	1	2.932	2.701	2.96	2.73
	27			1	2.932	2.701	2.96	2.73
COMMERCIAL	29	TROLL	NW COUT 113-97 1	1	3.225	2.701	3.26	2.73
COMMERCIAL	29	TROLL	NW COUT 113-71 1	1	3.225	2.701	3.23	2.70
COMMERCIAL	29	TROLL	NW COUT  -  1	1	3.225	2.701	3.23	2.70
COMMERCIAL	29	TROLL	NW COUT 154-  1	1	3.225	2.701	3.26	2.73
	29			4	12.900	10.804	12.97	10.86
COMMERCIAL	30	TROLL	NW    -  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW NOUT 116-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW NOUT 116-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW COUT 113-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW COUT 113-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW COUT 113-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW NOUT 116-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	GILLNET	NE LYNN 115-  1	1	4.703	2.891	4.70	2.89
COMMERCIAL	30	TROLL	NW NOUT 116-  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW    -  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	NW    -  1	1	2.447	2.701	2.45	2.70
COMMERCIAL	30	TROLL	-  1	1				
	30			12	29.173	29.901	29.17	29.90
COMMERCIAL	31	TROLL	NW    -  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW COUT 113-94 1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW NOUT 116-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW CNTR 114-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW CNTR 114-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW NOUT 116-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW NOUT 116-  1	1	2.616	2.701	2.64	2.73
COMMERCIAL	31	TROLL	NW COUT 113-  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	NW COUT  -  1	1	2.616	2.701	2.62	2.70
COMMERCIAL	31	TROLL	-  1	1				
	31			10	23.544	24.309	23.57	24.34

Continued

Appendix Table 4. Preliminary 1987 coded wire tag recovery data for Auke Creek coho salmon (continued).

Sample... Source	Stat Week	Gear...	----- Areas ----- QD PMFC DISTR C R	Observed	Expansion Factor(WQ)	Preferred Expansion	Contrib.. (WQ)	Preferred Contrib.
COMMERCIAL	32	TROLL	NE CNTR 112-16 1	1	1.108	2.965	1.12	3.00
COMMERCIAL	32	TROLL	NW COUT 113-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW COUT  -  1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW COUT 113-91 1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW NOUT 157-  1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	NW COUT 113-95 1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	NW CNTR 114-  1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	NW CNTR 114-23 1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NE CNTR 112-13 1	1	1.108	2.965	1.11	2.97
COMMERCIAL	32	TROLL	NW NOUT 116-13 1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW NOUT 157-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW COUT 113-  1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	NW COUT 113-11 1	1	2.050	2.701	2.07	2.73
COMMERCIAL	32	TROLL	-  1	1				
COMMERCIAL	32	TROLL	-  1	1				
COMMERCIAL	32	TROLL	-  1	1				
COMMERCIAL	32	TROLL	NE SNTR 109-61 1	1	1.108	2.965	1.11	2.97
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NW NOUT 116-  1	1	2.050	2.701	2.05	2.70
COMMERCIAL	32	TROLL	NE SNTR 109-  1	1	1.108	2.965	1.11	2.97
				-----				
32				26	43.382	63.179	43.56	63.43
COMMERCIAL	33	TROLL	NW CNTR 114-  1	1	4.873	3.962	4.87	3.96
COMMERCIAL	33	TROLL	NW CNTR 114-  1	1	4.873	3.962	4.87	3.96
COMMERCIAL	33	TROLL	NW COUT 113-  1	1	4.873	3.962	4.87	3.96
				-----				
33				3	14.619	11.886	14.62	11.89
COMMERCIAL	34	TROLL	NW CNTR 114-27 1	1	3.302	3.962	3.30	3.96
COMMERCIAL	34	TROLL	NW    -  1	1	3.302	3.962	3.34	4.00
COMMERCIAL	34	TROLL	NW    -  1	1	3.302	3.962	3.30	3.96
COMMERCIAL	34	TROLL	NW    -  1	1	3.302	3.962	3.34	4.00
COMMERCIAL	34	TROLL	NW    -  1	1	3.302	3.962	3.34	4.00
COMMERCIAL	34	TROLL	NW NOUT 116-  1	1	3.302	3.962	3.30	3.96

Continued

Appendix Table 4. Preliminary 1987 coded wire tag recovery data for Auke Creek coho salmon (continued).

Sample... Source	Stat Week	Gear...	----- Areas -----				Observed	Expansion. Factor(WQ)	Preferred Expansion	Contrib.. (WQ)	Preferred Contrib.
COMMERCIAL	34	TROLL	NW NOUT 116-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW    -	1	1	3.302	3.962	3.34	4.00		
COMMERCIAL	34	TROLL	NW    -	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW NOUT 156-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW CNTR 114-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW CNTR 114-23	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW CNTR 114-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW CNTR 114-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW    -	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW    -	1	1	3.302	3.962	3.34	4.00		
COMMERCIAL	34	TROLL	NW    -	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW COUT 113-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW NOUT 116-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NW NOUT 116-	1	1	3.302	3.962	3.30	3.96		
COMMERCIAL	34	TROLL	NE CNTR 112-	1	1	2.045	2.328	2.05	2.33		
COMMERCIAL	34	TROLL	NW NOUT 181-	1	1	3.302	3.962	3.30	3.96		
						-----	-----	-----	-----		
	34				22	71.387	85.530	71.56	85.74		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW NOUT 116-	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW NOUT 116-	1	1	4.571	3.962	4.62	4.00		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.62	4.00		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW COUT 113-91	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW    -	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW CNTR 114-27	1	1	4.571	3.962	4.57	3.96		
COMMERCIAL	35	TROLL	NW NOUT 116-11	1	1	4.571	3.962	4.57	3.96		

Continued

Appendix Table 4. Preliminary 1987 coded wire tag recovery data for Auke Creek coho salmon (continued).

Sample... Source	Stat Week	Gear...	----- Areas ----- QD FMFC DISTR R	Observed	Expansion. Factor(WQ)	Preferred Expansion	Contrib.. (WQ)	Preferred Contrib.
COMMERCIAL	35	TROLL	NW CNTR 114-27 1	1	4.571	3.962	4.62	4.00
COMMERCIAL	35	TROLL	NE CNTR 112-14 1	1	3.061	2.328	3.09	2.35
COMMERCIAL	35	TROLL	NW CNTR 114-  1	1	4.571	3.962	4.57	3.96
COMMERCIAL	35	TROLL	NW CNTR 114-  1	1	4.571	3.962	4.57	3.96
COMMERCIAL	35	TROLL	NW COUT  -  1	1	4.571	3.962	4.57	3.96
COMMERCIAL	35	TROLL	NW COUT  -  1	1	4.571	3.962	4.62	4.00
COMMERCIAL	35	SEINE	NW CNTR 114-25 1	1				
				28	121.907	105.340	122.13	105.53
COMMERCIAL	36	TROLL	NW CNTR 114-  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT 116-  1	1	3.704	3.962	3.74	4.00
COMMERCIAL	36	TROLL	NW NOUT 156-  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-25 1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT  -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-23 1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-  1	1	3.704	3.962	3.74	4.00
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT 116-12 1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT 116-12 1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT 116-12 1	1	3.704	3.962	3.74	4.00
COMMERCIAL	36	TROLL	NW CNTR 114-25 1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW CNTR 114-25 1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW    -  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	TROLL	NW NOUT 116-  1	1	3.704	3.962	3.70	3.96
COMMERCIAL	36	GILLNET	NE    -  1	1	5.322		5.32	
				23	86.810	87.164	86.93	87.29

Continued

Appendix Table 4. Preliminary 1987 coded wire tag recovery data for Auke Creek coho salmon (continued).

Sample... Source	Stat Week	Gear...	----- Areas ----- QD FMFC DISTR R	Observed	Expansion. Factor(WQ)	Preferred Expansion	Contrib.. (WQ)	Preferred Contrib.
COMMERCIAL	37	TROLL	NW    -  1	1	5.208	3.962	5.21	3.96
COMMERCIAL	37	TROLL	NW    -  1	1	5.208	3.962	5.26	4.00
COMMERCIAL	37	GILLNET	NE LYNN 115-	1	5.083	6.360	5.08	6.36
COMMERCIAL	37	TROLL	NW NOUT 181-	1	5.208	3.962	5.21	3.96
COMMERCIAL	37	GILLNET	NE LYNN 115-	1	5.083	6.360	5.08	6.36
COMMERCIAL	37	GILLNET	NE LYNN 115-	1	5.083	6.360	5.14	6.43
COMMERCIAL	37	GILLNET	NE LYNN 115-	1	5.083	6.360	5.08	6.36
COMMERCIAL	37	GILLNET	NE LYNN 115-	1	5.083	6.360	5.08	6.36
COMMERCIAL	37	GILLNET	NE LYNN 115-	1	5.083	6.360	5.08	6.36
COMMERCIAL	37	GILLNET	NE LYNN 115-	1	5.083	6.360	5.08	6.36
COMMERCIAL	37	GILLNET	NE    -  1	1	5.083		5.08	
COMMERCIAL	37	GILLNET	NE    -  1	1	5.083		5.08	
				12	61.371	56.406	61.48	56.51
COMMERCIAL	38	TROLL	NW CNTR 114-25 1	1	4.118	3.962	4.12	3.96
COMMERCIAL	38	TROLL	NW CNTR 114-  1	1	4.118	3.962	4.12	3.96
				2	8.236	7.924	8.24	7.92
COMMERCIAL				143	476.261	485.144	477.18	486.14
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
SPORT	33	NE STEP 111-50 1		1				
				9				
SPORT	37	NE STEP 111-50 1		1				
				1				
SPORT				10				
TOTALS				153.	476.261	485.144	477.18	486.14

Continued



Appendix Table 4. Preliminary 1987 coded wire tag recovery data for Auke Creek coho salmon (continued).

Sample... Source	Stat Week	Gear...	----- Areas -----	Obser ved
			QD PMFC DISTR R	
SELECT RECOVERIES				
COMMERCIAL	29		-  1	1
				-----
	29			1
COMMERCIAL	30	TROLL	-  1	1
COMMERCIAL	30	TROLL	-  1	1
				-----
	30			2
COMMERCIAL	31	TROLL	NW NOUT 189-	1 1
COMMERCIAL	31	TROLL	NW NOUT 189-	1 1
COMMERCIAL	31	TROLL	-  1	1
COMMERCIAL	31	TROLL	NW    -  1	1
				-----
	31			4
COMMERCIAL	32	TROLL	-  1	1
COMMERCIAL	32	TROLL	-  1	1
				-----
	32			2
COMMERCIAL	34	TROLL	NW    -  1	1
COMMERCIAL	34	TROLL	-  1	1
COMMERCIAL	34	TROLL	-  1	1
COMMERCIAL	34	TROLL	-  1	1
COMMERCIAL	34	TROLL	-  1	1
COMMERCIAL	34	TROLL	-  1	1
COMMERCIAL	34	TROLL	NW COUT 113-	1 1
COMMERCIAL	34	TROLL	NW    -  1	1
				-----
	34			8
COMMERCIAL	35	TROLL	-  1	1
COMMERCIAL	35	TROLL	-  1	1
COMMERCIAL	35	TROLL	-  1	1
COMMERCIAL	35	TROLL	-  1	1
COMMERCIAL	35	TROLL	-  1	1
				-----
	35			5

Continued

Appendix Table 4. Preliminary 1987 coded wire tag recovery data for Auke Creek coho salmon (continued).

Sample...	Stat	Gear...	----- Areas -----				Obser
Source	Week		QD	PMFC	DISTR	C	R ved
SELECT RECOVERIES							
COMMERCIAL	36	TROLL			-		1 1
COMMERCIAL	36	TROLL			-		1 1
COMMERCIAL	36	TROLL			-		1 1
COMMERCIAL	36	TROLL			-		1 1
COMMERCIAL	36	TROLL			-		1 1
COMMERCIAL	36	TROLL			-		1 1
COMMERCIAL	36	TROLL			-		1 1
COMMERCIAL	36	TROLL			-		1 1
							-----
	36						8
COMMERCIAL	37	TROLL			-		1 1
COMMERCIAL	37	TROLL	NW	CNTR		114-25	1 1
COMMERCIAL	37	TROLL	NW	CNTR		114-	1 1
COMMERCIAL	37	TROLL	NW	CNTR		114-	1 1
							-----
	37						4
COMMERCIAL	38	TROLL			-		1 1
COMMERCIAL	38	TROLL			-		1 1
COMMERCIAL	38	TROLL			-		1 1
COMMERCIAL	38	TROLL			-		1 1
COMMERCIAL	38	TROLL			-		1 1
COMMERCIAL	38	TROLL			-		1 1
COMMERCIAL	38	TROLL			-		1 1
COMMERCIAL	38	TROLL			-		1 1
							-----
	38						8
COMMERCIAL	39	TROLL			-		1 1
COMMERCIAL	39	TROLL			-		1 1
COMMERCIAL	39	TROLL			-		1 1
COMMERCIAL	39	TROLL			-		1 1
COMMERCIAL	39	TROLL			-		1 1
							-----
	39						5
							-----
COMMERCIAL							47
TOTALS .....							47

Appendix Table 5. 1987 coho salmon escapement surveys.

Date	Dist- tance	Type	Number at Mouth	Number Inter- tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi- bility	Water	Tide	Obs Init	Remarks	Statis- tical Week	Record Id
Stream Number 101-15-019															
10/09	5.0	Foot			532		532	Coho	Normal	Normal	Inter	SH	ABOVE LAKE TO BIG BEND	41	8712614
Stream Number 101-15-085															
09/26	Length	Foot			94		94	Coho	Excel	Normal	Inter	JFK		39	8711603
10/21	Length	Foot			432		432	Coho	Normal	Normal	Inter	JK	150 DOLLY VARDENS	43	8712303
Stream Number 101-29-006															
10/08	3.5	Foot			108		108	Coho	Normal	Normal	Inter	SH	200+ DOLLY VARDEN	41	8712601
10/25	3.5	Foot			71		71	Coho	Normal	Normal	Inter	SH		44	8712702
Stream Number 101-30-083															
10/08	Length	Foot			337		337	Coho	Normal	Normal	Inter	LD		41	8712616
10/25	Length	Foot			650		650	Coho	Normal	Normal	Inter	PD		44	8712105
Stream Number 101-45-024															
10/14	3.0	Foot			40		40	Coho	Poor	High	Inter	JFK	TOO DARK	42	8711804
Stream Number 101-45-078															
08/24	Length	Foot			2		2	Coho	Excel	Low	Inter	JFK		35	8708703
10/29	Length	Foot			180		180	Coho	Normal	Normal	Inter	JFK		44	8712401
Stream Number 101-47-015															
10/24	Length	Foot			56		56	Coho	Normal	Normal	Inter	SH		43	8712701
Stream Number 101-71-004															
10/29	Length	Foot			34		34	Coho	Poor	Normal	Inter	PD	INDIAN CREEK	44	8712403

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visibility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number 101-71-028															
10/23	Length	Foot			160		160	Coho	Normal	Normal	Inter	PD		43	8712103
Stream Number 101-75-005															
11/04	2.0	Foot			92		92	Coho	Normal	Normal	Inter	LMJ 1	DOLLY VARDEN	45	8712301
Stream Number 101-75-015															
10/29	Length	Foot			154		154	Coho	Normal	Normal	Inter	LJ		44	8712402
Stream Number 101-90-029															
10/07	Length	Foot			65		65	Coho	Normal	Normal	Inter	SH		41	8712605
10/22	Length	Foot			73		73	Coho	Normal	Normal	Inter	EDH	ALL DARK FISH	43	8712201
Stream Number 102-60-082															
10/31	1.0	Foot			5		5	Coho	Normal	Normal	Inter	SH		44	8712705
Stream Number 103-60-059															
10/30	Length	Foot			29	1	30	Coho	Normal	Normal	Inter	SH		44	8712703
Stream Number 103-60-077															
10/31	1.5	Foot			48		48	Coho	Normal	Normal	Inter	SH		44	8712704
Stream Number 106-30-080															
07/28	Length	Aerial	3				3	Coho	Normal	Normal	Low	WB 4 J @ M	LOOK LIKE COHO	31	8703202

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi-bility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number 106-41-010 SALMON BAY CREEK															
08/22	Length	Foot		1	2		3	Coho	Normal	Low	Inter	DAH	NONE ABOVE WEIR	34	8708504
10/22		Weir			1,235		1,235	Coho		Low	Inter	F&G		43	8714908
10/22	Length	Foot			11		11	Coho	Normal	Normal	Inter	D L	WEST FORK	43	8714912
10/22	2.0	Foot			17		17	Coho	Normal	Normal	Inter	D L	SNORKLE WEIR TO MOUTH	43	8714913
Stream Number 106-43-075 DUNCAN CK DUNCAN C															
09/15	Length	Aerial						Coho	Poor	High	Low	RCL	H2O TOO HIGH AND DARK	38	8713301
10/08	Length	Helo						Coho	Poor	Normal	High	RCL	SHADOWS & DK POOLS	41	8715108
Stream Number 106-44-006 FALLS CK MITKOF IS															
09/24	5.0	Foot			21		21	Coho	Normal	Normal	High	RGZ	LOTS OF DEEP DARK POOL	39	8714501
09/24	5.0	Foot			21		21	Coho	Normal	Normal	High	RGZ	BELOW BRIDGE	39	8714702
10/30	5.0	Foot			4	1	5	Coho	Normal	Normal	High	RGZ	ALL IN 1/2 M BLW BRDG	44	8714703
Stream Number 107-40-038 MARTEN CK BRADFIELD															
10/08	Length	Helo						Coho	Poor	Normal	Inter	WB	ALL SHADOWS	41	8715102
Stream Number 107-40-049 HARDING RIVER															
10/08	Length	Helo						Coho	Normal	Normal	Inter	WB	COULDN'T SEE IN POOLS	41	8715103
Stream Number 107-40-049 HARDING RIVER															
11/18	Length	Helo			70		70	Coho	Normal	Low	Inter	RCL	POOR VIS IN LWR POOLS	47	8715003

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visibility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number 107-40-053 BRADFELD RIVER E FK															
10/08	Length	Helo						Coho	Normal	Normal	Inter	WB	COULD'T SEE IN POOLS	41	8715105
11/18	9.0	Helo			160		160	Coho	Normal	Low	Inter	RCL	POOR VIS LOWR POOLS	47	8715005
Stream Number 108-40-010 NORTH ARM CREEK															
10/22	Length	Helo			22		22	Coho	Normal	Normal	Inter	WB	POOLED BRUSHY	43	8715208
11/07	Length	Helo			23		23	Coho	Normal	Low	Inter	RCL	MOST UPPER POOL AREA	45	8715218
12/01	Length	Helo						Coho	Poor	Normal	Inter	RCL	STRONG GUSTY WIND	49	8715301
Stream Number 108-40-013 SHAKES SLOUGH															
10/22	Length	Helo			7		7	Coho	Poor	Normal	Inter	WB	BRUSHY	43	8715206
11/07	Length	Helo			6		6	Coho	Normal	Low	Inter	RCL	SAME AREA AS 10/22	45	8715217
12/01	Length	Helo						Coho	Normal	Normal	Inter	RCL	NO BEARS OR EAGLES	49	8715307
Stream Number 108-40-014 KETILI CREEK BARNES															
10/22	Length	Helo			45		45	Coho	Poor	Normal	Inter	WB	MUDDY, FISH POOLED	43	8715201
11/07	Length	Helo			690		690	Coho	Normal	Normal	Inter	RCL	NO FISH LAKE OR SLOUGH	45	8715215
12/01	Length	Helo			85	10	95	Coho	Normal	Normal	Inter	RCL	IN PAIRS OLD FISH	49	8715305
Stream Number 108-40-016 KIKAHE RIVER															
10/22	Length	Helo			142		142	Coho	Excel	Normal	Inter	WB	FISH POOLED	43	8715202
11/07	Length	Helo			129		129	Coho	Normal	Low	Inter	RCL	NO FISH DEEP POOLS	45	8715214
12/01	Length	Helo			17		17	Coho	Excel	Low	Inter	RCL	FISH RAGS	49	8715304
Stream Number 108-40-017 GOAT CK STIKINE R															
10/22	Length	Helo			1		1	Coho	Poor	Normal	Inter	WB	PARTLY GLACIAL	43	8715203

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Dist- tance	Type	Number at Mouth	Number Inter- tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi- bility	Water	Tide	Obs Init	Remarks	Statis- tical Week	Record Id
Stream Number 108-40-018 SHUKTUSA BRANCH															
10/22	Length	Helo			115		115	Coho	Excel	Normal	Inter	WB	ALL ABV RAPIDS	43	8715205
11/07	Length	Helo			4		4	Coho	Normal	Low	Inter	RCL	ABV RAPIDS	45	8715213
12/01	Length	Helo						Coho	Normal	Low	Inter	RCL	NO BEARS OR EAGLES	49	8715303
Stream Number 108-40-020 ANDREWS CREEK															
08/25	Length	Foot			1		1	Coho	Excel	Low	Inter	RT		35	8712104
10/22	Length	Helo			275		275	Coho	Excel	Normal	Inter	WB	ALL SCHOOLED	43	8715207
11/07	Length	Helo			205		205	Coho	Normal	Low	Inter	RCL	NO FISH DEEP POOLS	45	8715212
12/01	Length	Helo			20		20	Coho	Excel	Low	Inter	RCL	VERY RATTY FISH	49	8715302
Stream Number 108-40-040 BLIND SLOUGH SUMNER															
09/23	1.5	Foot			48		48	Coho	Normal	Normal	Inter	RGZ		39	8714301
09/23	1.5	Foot			48		48	Coho	Normal	Normal	Inter	RGZ		39	8714706
10/22	2.0	Foot			12		12	Coho	Normal	Normal	High	RGZ		43	8714707
Stream Number 108-40-050 OHMER CREEK															
09/23	2.5	Foot		45	4		49	Coho	Normal	Normal	Inter	RGZ		39	8714401
09/23	2.5	Foot		45	4		49	Coho	Normal	Normal	Inter	RGZ		39	8714708
10/22	2.0	Foot		1	1	1	3	Coho	Normal	Normal	High	RGZ		43	8714709
Stream Number 108-50-003 BEAR CK FREDERICK SD															
09/22	1.5	Foot			1		1	Coho	Normal	Normal	High	RGZ	STRM LRG FOR GOOD SURV	39	8714601
09/22	1.5	Foot			1		1	Coho	Normal	Normal	High	RGZ	LOWER INDEX AREA	39	8714704
10/07	6.0	Foot			26		26	Coho	Normal	Normal	High	RGZ	5 INDEX 21 ABV.	41	8714705

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Dist- tance	Type	Number at Mouth	Number Inter- tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi- bility	Water	Tide	Obs Init	Remarks	Statis- tical Week	Record Id
Stream Number 111-32-038      SOCKEYE CREEK-TAKU															
10/19	10	Helo						Coho	Poor	High	High	STE	TURBID-NO COUNT	43	8708802
10/19	3.0	Aerial						Coho	Poor	High	High	STE	HIGH-TURBID	43	8708806
11/02	3.0	Helo			660		660	Coho	Excel	Low	High	STE	60%SCHOOLED -RAIN	45	8708808
11/04	Length	Helo			1,040		1,040	Coho	Excel	Low	High	JJM	ON RIFFLES CLR H20	45	8708705
11/04	Length	Helo			840		840	Coho	Excel	Low	High	STE	80% ON REDDS	45	8708706
Stream Number 111-32-056      FISH CREEK-TAKU R															
09/23		Aerial			100		100	Coho	Normal	Low	High	JJM	REDS IN FRONT POOL	39	8707503
10/09	Length	Aerial						Coho	Normal	High	High	JJM	0 SEEN BEHIND IS.	41	8708217
10/09	Length	Helo			80		80	Coho	Normal	Normal	High	LS		41	8708604
10/09	.5	Helo			150		150	Coho	Normal	Normal	High	STE	TURBID-NO COUNT	41	8708804
11/02	1.0	Helo			250		250	Coho	Excel	Low	High	STE	150 IN GLACIAL PORTION	45	8708810
Stream Number 111-32-066      YEHRING CREEK-TAKU R															
09/23		Aerial			250		250	Coho	Normal	Low	High	JJM	GLACIAL	39	8707502
09/29		Weir			1,513		1,513	Coho		Low	High	SE	WEIR WASHED OUT	40	8708904
10/09	Length	Helo			340		340	Coho	Poor	High	High	LS		41	8708617
10/09	1.5	Helo			220		220	Coho	Normal	Normal	High	STE		41	8708805
11/02	1.5	Helo			355		355	Coho	Excel	Low	High	STE		45	8708811
11/04	Length	Helo			590		590	Coho	Excel	Low	High	JJM	EXCELLENT THIS LATE	45	8708709
11/04	Length	Helo			520		520	Coho	Excel	Low	High	STE	60% ON REDDS	45	8708710
11/12	Length	Popest.			1,627		1,627	Coho					STE ADD UNMARK FISH		

Continued



Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi-bility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number 111-32-068			JOHNSON CREEK-TAKU R												
09/23	1.2	Foot			150		150	Coho	Excel	Low	High	KJK		39	8708801
09/23		Aerial			3		3	Coho	Excel	Low	High	JJM		39	8707501
Stream Number 111-32-203			WILMS CREEK-TAKU R												
09/23		Aerial						Coho	Normal	Low	High	JJM TOO GLACIAL		39	8707504
10/09	Length	Aerial			50		50	Coho	Poor	High	High	JJM WATER CLDY AND HIGH		41	8708213
10/09	Length	Helo			10		10	Coho	Poor	High	High	LS GLACIAL		41	8708603
10/09	2.0	Helo						Coho	Poor	High	High	STE TURBID-NO COUNT		41	8708803
10/19	2.0	Aerial						Coho	Poor	High	High	STE HIGH-TURBID		43	8708807
11/02	8.0	Helo			350		350	Coho	Poor	High	High	STE HIGH,TURBID,RAIN		45	8708809
11/04	Length	Helo			1,950		1,950	Coho	Excel	Low	High	JJM 350 BELOW PT.1600 ABV		45	8708707
11/04	Length	Helo			2,250		2,250	Coho	Excel	Low	High	STE 80% ON REDDS		45	8708708
Stream Number 111-32-260			HACKETT RIVER												
10/13		Weir			1,715		1,715	Coho		Low	High	CAN		42	8708717
Stream Number 111-32-270			NAHLIN RIVER												
09/15	Length	Helo			156	9	165	Coho	Excel	Normal	High	LS		38	8708601
Stream Number 111-32-280			DUDIDONTU RIVER												
09/15	Length	Helo			252	24	276	Coho	Excel	Normal	High	LS	INC KAKUCHUYA CR.	38	8708602

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Dist- tance	Type	Number at Mouth	Number Inter- tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi- bility	Water	Tide	Obs Init	Remarks	Statis- tical Week	Record Id
Stream Number 111-40-007			SWITZER CREEK												
10/07	Length	Foot			48		48	Coho	Excel	Low	High	MB		41	8708414
10/14	Length	Foot			39	4	43	Coho	Normal	Normal	High	MB		42	8708415
10/22	Length	Foot			23	4	27	Coho	Excel	Normal	High	MB		43	8708416
Stream Number 111-50-010			PETERSON CK FAVOR C												
10/07	Length	Foot			193	11	204	Coho	Excel	Low	High	MB		41	8708405
10/07	Length	Foot			193	11	204	Coho	Excel	Low	High	MB		41	8708406
Stream Number 111-50-042			AUKE CREEK												
10/30		Weir			662		662	Coho		Low	High	JT	ALL WILD STOCKS	44	8708704
Stream Number 111-50-052			MONTANA CREEK												
10/08	Length	Foot			312	2	314	Coho	Excel	Low	High	MB		41	8708412
10/22	Length	Foot			137		137	Coho	Normal	Normal	High	KM		43	8708413
Stream Number 111-50-062			JORDON CREEK												
10/09	Length	Foot			51	2	53	Coho	Excel	Low	High	MB		41	8708408
10/22	Length	Foot			231	20	251	Coho	Excel	Low	High	MB		43	8708409
10/30	Length	Foot			116	29	145	Coho	Excel	Low	High	MB		44	8708410
Stream Number 111-50-075			PETERSON CK DOUG IS												
10/09	Length	Foot			27		27	Coho	Excel	Low	High	MB	FROM TRAIL UPSTREAM	41	8708301
10/30	Length	Foot						Coho	Excel	Low	High	MB	FROM TRAIL UPSTREAM	44	8708302

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Dist- tance	Type	Number at Mouth	Number Inter- tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi- bility	Water	Tide	Obs Init	Remarks	Statis- tical Week	Record Id
Stream Number	112-67-035														
08/24	Length	Aerial			500		500	Coho	Excel	Low	Low	DJI	SCHS IN RIVER	35	8705311
09/02	Length	Aerial	300	1,000			1,300	Coho	Excel	Normal	Inter	DJI	MANY JUMPS IN LAKE	36	8705708
09/08	Length	Aerial			500		500	Coho	Normal	Normal	Low	DJI		37	8706003
09/15		Aerial			400		400	Coho	Excel	Normal	Low	DJI	LOWER RIVER	38	8706801
Stream Number	112-80-028														
10/08	Length	Aerial			200		200	Coho	Excel	Normal	Low	DJI		41	8708206
10/08	Length	Foot		400	86		486	Coho	Excel	Normal	Low	DJI	50 % BIGHT	41	8708208
Stream Number	113-41-015														
09/24	Length	Foot			16		16	Coho	Normal	Normal	Low	RDJ	MIXED DARK & BRITE	39	8704704
10/09	Length	Foot			36		36	Coho	Normal	Normal	Low	AS	SOME BRITE FISH	41	8704711
Stream Number	113-41-019														
10/21	Length	Foot			53		53	Coho	Normal	Normal	Low	BD SJ		43	8704714
Stream Number	113-41-032														
10/06		Weir			616		616	Coho		Normal	Low	AS		41	8705102
Stream Number	113-41-042														
09/23	Length	Foot			40		40	Coho	Normal	Normal	Low	AS	DARK FISH	39	8704701
Stream Number	113-62-005														
09/24	Length	Foot			167		167	Coho	Normal	Normal	Low	AD	MIXED DARK & BRITE	39	8704705
10/30	Length	Foot			9		9	Coho	Normal	Normal	Low	JK	SPAWN OUTS BUT LIVE	44	8704716

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi-bility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number 113-62-008 SINITSIN COVE HEAD															
09/28	Length	Foot			20		20	Coho	Normal	Normal	Low	SR	DIVE,+12STRAY,1AD CLIP	40	8704706
10/08	Length	Foot			18		18	Coho	Normal	Normal	Low	AD	ALL DARK	41	8704707
Stream Number 113-66-006 ST JOHN BAPTIST HEAD															
09/23	Length	Foot			4		4	Coho	Normal	Normal	Low	AD	DARK FISH	39	8704703
Stream Number 113-73-003 LAKE STREAM FORD ARM															
10/31		Weir			1,694		1,694	Coho		Normal	Low	MK	WEIR IN 8/11	44	8752101
10/31		Weir			136		136	Coho		Normal	Low	MK	WEIR IN 8/11	44	8705217
10/31	Length	Weir			1,694		1,694	Coho		High	Low	MK	WEIR IN 8/11	44	8705201
Stream Number 113-81-011 BLACK RIVER															
10/09	Length	Helo			262		262	Coho	Normal	Normal	Low	AS	GOOD SURVEY	41	8704709
Stream Number 115-20-010 BERNERS RIVER															
09/08	Length	Aerial						Coho	Poor	High	High	DJI	NONE SEEN, GLACIAL	37	8706015
09/15		Aerial			170		170	Coho	Normal	Normal	Low	DJI	150 LOWER RIVER	38	8706811
09/22	Length	Aerial			235		235	Coho	Excel	Low	Low	RS	NONE IN LOWER PART	39	8708101
09/30	Length	Aerial			150		150	Coho	Poor	High	Low	DJI	NONE LOWER RIVER	40	8708204
10/09	Length	Aerial			1,450		1,450	Coho	Normal	Normal	Low	WP	100 LOWER RIVER	41	8706016
10/27		Foot			3,260		3,260	Coho	Excel	Low	Low	LS	MOST BEAVER PD POOL	44	8707716
Stream Number 115-32-025 CHILKAT RIVER															
10/30	Length	Aerial						Coho	Poor	High	Low	RPE	VERY GLACIAL	44	8710002
11/13		Aerial			3		3	Coho	Poor	High	Low	RPE	VERY MURKY	46	8710007

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi-bility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number 115-32-030 TAKHIN RIVER															
10/30	Length	Aerial						Coho	Poor	High	Low	RPE	VERY GLACIAL	44	8710001
11/13	Length	Aerial			130		130	Coho	Normal	Normal	Low	RPE	GLACIAL LOWER END	46	8710006
Stream Number 115-32-032 CHILKAT LAKE OUTLET															
10/08	Length	Foot			12		12	Coho	Normal	Normal	High	RPE		41	8709906
10/27	Length	Foot			23		23	Coho	Normal	Normal	High	RPE	2 JACKS	44	8709916
11/04	Length	Foot			4		4	Coho	Normal	Normal	High	RPE	PAST PEAK	45	8710003
11/20		Weir			938		938	Coho		Normal	High	STE	EXCLUDES JACKS	47	8707916
Stream Number 115-32-040 SPRING CK-L SALMON R															
10/07	Length	Foot			26		26	Coho	Excel	High	High	RPE	7 JACKS	41	8709905
10/13	Length	Foot			54		54	Coho	Normal	Normal	High	RPE	9 JACKS	42	8709908
10/22	Length	Foot			84	2	86	Coho	Excel	Normal	High	RPE	13 JACKS	43	8709915
Stream Number 115-32-057 31 MILE CREEK															
10/19	Length	Foot			24		24	Coho	Normal	Normal	High	RPE	9 JACKS	43	8709912
10/28	Length	Foot			51		51	Coho	Excel	Normal	High	RPE	14 JACKS	44	8709917
11/09	Length	Foot			39	3	42	Coho	Normal	Normal	High	RPE	3 JACKS	46	8710005
Stream Number 115-32-064 KELSALL RIVER															
10/16	Length	Aerial			35		35	Coho	Normal	Normal	High	RPE		42	8709911
10/30	Length	Aerial			40		40	Coho	Poor	High	High	RPE		44	8709918
11/05		Foot			184		184	Coho	Normal	Normal	High	RPE	13 JACKS	45	8710004

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visi-bility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number	115-32-068	TAHINI RIVER													
10/09	Length	Foot			284		284	Coho	Normal	High	High	RPE 27	JACKS	41	8709907
10/14	Length	Foot			691	5	696	Coho	Excel	Normal	High	RPE 96	JACKS	42	8709909
10/20	Length	Foot			297	3	300	Coho	Poor	Normal	High	RPE 19	JACKS	43	8709914
Stream Number	115-33-020	CHILKOOT LAKE OUTLET													
11/03		Weir			548		548	Coho		Normal	High	FB		45	8707912
11/03		Pop.Est.			807		807	Coho				STE POP EST EXCLUDES JACKS			
Stream Number	182-50-010	ITALIO RIVER													
09/05	Length	Aerial			100		100	Coho	Normal	Low	High	GT		36	8709701
09/05	1	Aerial						Coho	Poor	Normal	High	GT	WATER DARK AND DIRTY	36	8709702
09/11	Length	Aerial						Coho	Poor	High	Low	GT	DARK HIGH WATER	37	8709706
09/11	Length	Aerial			2,500		2,500	Coho	Normal	Normal	Low	GT	MIDDLE ITALIO CLEAR	37	8709707
10/09	L.	Aerial			1,000		1,000	Coho	Excel	Normal	Low	BK	MIDDLE ITALIO	41	8709715
10/09	L.	Aerial			400		400	Coho	Excel	Normal	Low	RJ	MAIN ITALIO	41	8709716
Stream Number	182-80-010	LOST RIVER													
11/13	3.0	Foot			82		82	Coho	Normal	High	Low	RJ	AIRPORT FISHPASS DITCH	46	8710010
Stream Number	182-80-030	TAWAH CREEK													
09/01	6	Boat			236		236	Coho	Normal	Low	Low	GT	WATER VERY LOW	36	8709609
09/22	Length	Aerial			1,500		1,500	Coho	Poor	High	Low	RJ	H2O VERY VERY HIGH	39	8709709
10/08	3.	Boat			5,000		5,000	Coho	Excel	High	Low	BK		41	8709713
11/13	2.5	Foot			62		62	Coho	Normal	High	Low	RJ	CANYON BEACH DITCH	46	8710009

Continued

Appendix Table 5. 1987 coho salmon escapement surveys (continued).

Date	Distance	Type	Number at Mouth	Number Inter-tidal	Number Live Salmon	Number Dead Salmon	Total Number of Salmon	Species	Visibility	Water	Tide	Obs Init	Remarks	Statistical Week	Record Id
Stream Number 185-10-010			YAHTSE RIVER												
09/05	Length	Aerial			150		150	Coho	Normal	Low	Inter	GT		36	8709617
09/11	Length	Aerial			300		300	Coho	Normal	Normal	Low	GT		37	8709703
Stream Number 192-42-020			TSIU RIVER												
08/23	3	Aerial			500		500	Coho	Excel	Low	Low	GW	9000 BELOW MARKERS	35	8709602
08/24	3	Aerial			500		500	Coho	Excel	Low	Low	GW	10000BELOW MARKERS	35	8709603
08/26	3	Aerial			5,700		5,700	Coho	Normal	Low	Low	GW	GOOD BELOW MARKER	35	8709606
08/29	3	Aerial			7,500		7,500	Coho	Excel	Low	Low	GT	4000 BELOW MARKER	35	8709607
09/01	Length	Aerial			8,500		8,500	Coho	Excel	Low	Low	GW		36	8709614
09/21	Length	Aerial			2,500		2,500	Coho	Poor	High	Low	BK	DARK HIGH FISH IN LK	39	8709711